CATALOG 64

Enco®

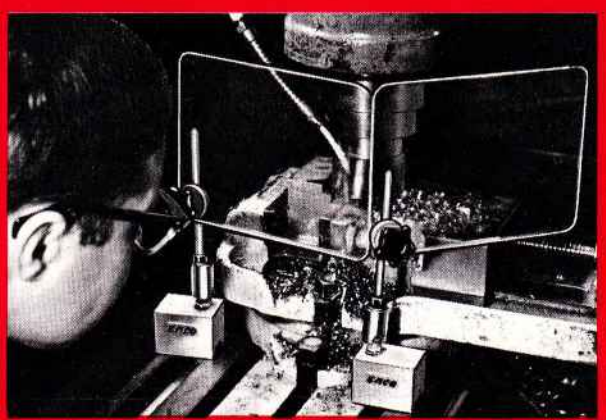
LATHE TURRETS
MICRO-SET® ADJUSTABLE CENTERS
TINY-TITAN® MAGNETIC BASE TOOLS

Enco® MANUFACTURING COMPANY

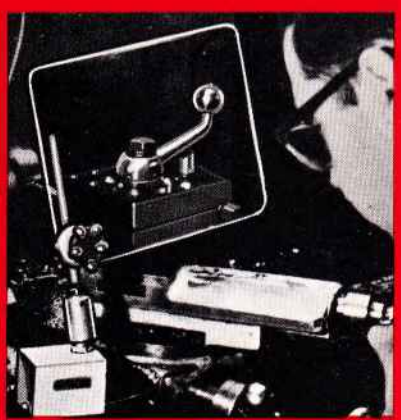
4520-26 W. FULLERTON AVENUE
CHICAGO, ILL. 60639, U.S.A.
PHONE: AREA CODE 312 • 227-6200

NEW MAGNETIC BASE SAFETY SHIELD

PROTECTS YOUR EYES AGAINST CHIP BURNS



Tandem installation of safety shields protects against hot chips . . . reduces splashing of coolant.



Safety shield on lathe protects operator from chip burns . . . allows perfect vision.

- **Prevent accidents—save lost man-hours**
- **80 lb. magnetic pull . . . grips flat or round surfaces**
- **Shield swivels 360° . . . locks securely in place**
- **Permits close examination of work without danger**
- **Fits lathes, mills, grinders, shapers, etc.**
- **Made of crystal clear, unbreakable acrylic plastic**

Shield Complete with Base		
Model No.	Size	Price
401	6"x8"	$11.95
402	8"x10"	12.65
403	10"x12"	13.60
404	12"x16"	15.00
405	16"x20"	17.60

Replacement Shields Only—⅛ in. Thick			
Model No.	Size	Carton of 3	Carton of 6
41	6"x8"	$ 4.95	$ 8.90
42	8"x10"	7.45	13.45
43	10"x12"	9.95	18.15
44	12"x16"	13.95	25.80
45	16"x20"	21.75	40.20

MAGNETIC BASE DIMENSIONS: 1-19/32"x2-5/32"x1-11/16" HIGH
HEIGHT FROM BASE TO TOP OF STEM: 8½"

MANUFACTURING COMPANY
4520-26 W. Fullerton Ave., Chicago 39, Ill.
Phone CA 7-6200 Area Code 312

Dear Customer:

Before we started in business - even before we had a name - we agreed on a principle and a promise:

> We would build the very best products we knew how to build...price them fairly...sell them honestly...and never be content until we knew our customers were completely satisfied with the quality, performance, and value of any product they bought from us.

For more than twenty years we have held fast to this principle. From the beginning and down to the present time, the metalworking industry's quick acceptance and hearty approval of the steadily growing Enco product line has been a source of deep gratification.

We owe a great deal to the thousands of satisfied customers who have bought Enco products in the past. To them we offer our sincere "Thank you". And to those who will choose Enco products in the future, we repeat the promise on which this company was founded.

Nathan Usiskin

Nathan Usiskin, President
Enco Manufacturing Company

MORE THAN 20 YEARS OF TURRET BUILDING EXPERIENCE stands behind every Enco product . . . your guarantee of performance, economy, and satisfaction

Enco TURRET TOOL POSTS

INCREASE LATHE PRODUCTION AT LOWER COST

MAKE ANY LATHE MORE EFFICIENT, MORE PRODUCTIVE

Enco Turrets—for all sizes of lathes—permit quick, low-cost conversion of your lathes to efficient production units. They enable you to mount 4 tools (tool holders, solid tools, boring bar holders, cut-off blade holders, special tools, form tools, etc.) instead of 1. This reduces piece-part time and labor costs while ensuring accurate repetitive work.

Lower costs and more than 50% greater production can result with an Enco Turret. For example: If you have a job requiring 4 operations (facing, turning, necking, chamfering) on 50 pieces, just set up the 4 tools and index the turret for each operation. (1) Production will increase more than 50% making the turret pay for itself on one job, (2) 196 costly, time consuming tool changes eliminated, (3) Less operator fatigue, (4) No chance of putting in the wrong tool, (5) More rigid tool mounting, (6) .0005″ guaranteed re-indexing accuracy.

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GUARANTEED .0005″ RE-INDEXING ACCURACY PLUS GREATER TOOL RIGIDITY MEANS PRECISION WORK

Whether you use an Enco Turret for repetitive production or in the toolroom for pilot runs, its built-in accuracy and maximum rigidity ensure precision work. In the Enco Turret design, precision hardened steel balls are used which have a sphericity of one twenty-five millionth of an inch. These balls are spring loaded and locked between accurately milled companion ball seats in the centerpost and tool block. In addition hardened and heat treated all steel construction of Enco Turrets ensures maximum rigidity of each tool plus life-long retention of their built-in accuracy. The extreme .0005″ accuracy of Enco Turrets often eliminates extra cuts on a lathe and sometimes, even secondary operations.

MINIMUM INVESTMENT GUARANTEES GREATER LATHE UTILITY AT LOWER COST

For a **bare fraction of a lathe's cost,** an Enco Turret Tool Post gives you these advantages:

1. More production from each machine
2. Lower piece-part costs
3. Guaranteed .0005″ repetitive accuracy of every tool at every position. (See back page for Guarantee)
4. Eliminate or minimize secondary operations.
5. Use of heavier solid or carbide tools.
6. Maximum rigidity of each tool—longer tool life.
7. Maintenance-free operation—(See "O" ring seal, opposite page).

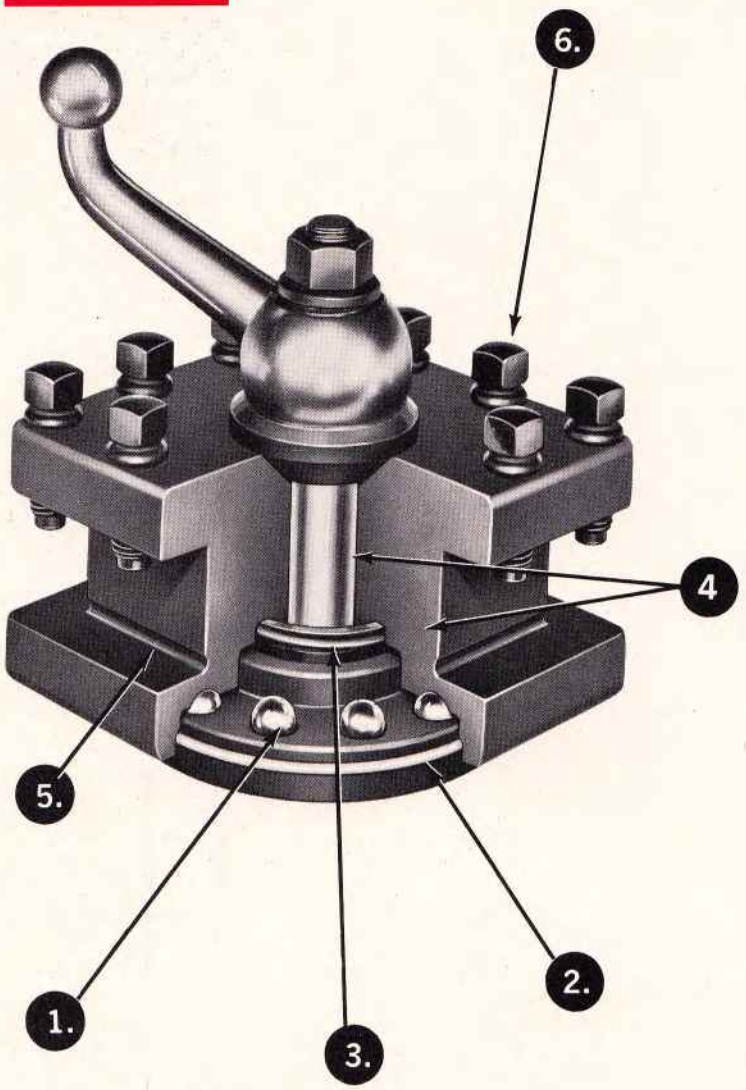
LATHE BUILDERS' RECOGNITION

Enco Turret Tool Posts are recognized by all leading lathe builders—Monarch, American, Lodge & Shipley, LeBlond, Sheldon, Cincinnati, Springfield, Sidney, Nebel, Axelson, Harrison, Logan, Rivett, Carroll-Jamieson, Clausing, Clausing-Colchester, Sigma, Elgin, Standard-Modern, Gallic, Delta, Celtic, Saimp, VDF and Tracer builders including Mimik, True-Trace, and Turchan Follower. After impartial and stringent tests in their own plants, these builders accepted and now list Enco Turrets as standard accessory equipment for their lathes.

12 STATION INDEXING— TRIPLE DUTY FROM EACH TOOL

Maximum tool efficiency is possible since all Enco Turrets index to 12 stations. Any of the 4 tools can be indexed to 3 working positions, enabling 1 tool to be used for 2 or 3 different operations if required. (See illustrations and drawings on page 3.) 12 station indexing means the use of standard tools on most jobs without re-grinding—an important advantage, because tools are often damaged in re-grinding. On jobs requiring 1 or 2 tools, duplicate tools can be set up in the turret to maintain uninterrupted production.

TURRET FEATURES



United States and Canadian Patent Nos.
2,481,712 2,471,403 2,908,195
2,817,546 2,841,042 2,847,890
608,873 other Patents Pending.

1 SIMPLE, RUGGED, PRECISELY ACCURATE BALL INDEXING WITH ACCURACY GUARANTEED WITHIN .0005″

Tool block locates and re-indexes on hardened steel precision balls which are locked between accurately milled companion ball seats in the tool block and center post base. Precision balls and mating ball seats guarantee re-indexing accuracy within .0005″. The balls can find only one seat in a spherical recess and will always return the tool block and tool to its true position.

2 EXCLUSIVE PATENTED "O" RING SEAL KEEPS OUT CHIPS, DIRT . . . REDUCES MAINTENANCE

Fine chips are kept out of the indexing mechanism by an "O" Ring Seal which ensures long, trouble-free operation and minimum maintenance. This is especially important when working with abrasive materials such as cast iron, aluminum or brass. Enco Turrets continue to operate accurately under severe chip conditions—eliminating costly machine down-time and maintenance.

3 EQUALIZER SPRING FOR EASIER INDEXING

Enco Turret Tool Posts are equipped with a heavy duty equalizer spring (shown compressed in photo at left) which facilitates indexing by raising the tool block when the handle is loosened. The spring also keeps the tool block and handle under constant spring loaded contact, thereby eliminating any possibility of chips entering the top of the turret.

4 HARDENED, SOLID STEEL TOOL BLOCK AND CENTER POST

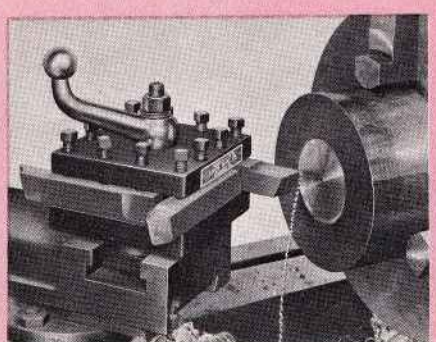
Hardened Tool Block and Center Post provide hard wear surfaces and tough core properties for maximum service. Lower portion of Center Post, when hardened, treated to permit machining (on machinable base models). Forged tool blocks supplied on 6-S and Heavy Duty Models.

5 RECESSED TOOL BLOCK SLOT FOR ACCURATE SHANK HOLDING

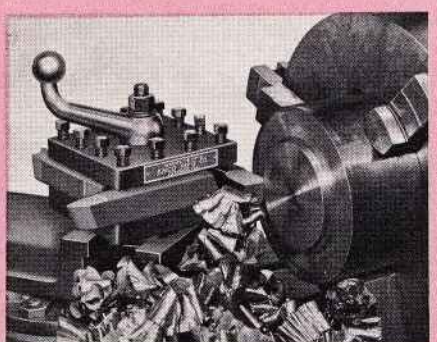
Recessed fillet on all sides allows for accurate seating of sharp cornered tools and tool holders.

6 3 HEAVY CLAMPING SCREWS provide rigid, full-length holding of tool shank to withstand heavy cuts. Especially important when using carbide tool holders and machining "tough" metals.

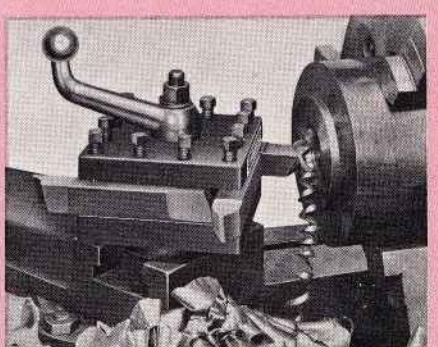
Flexibility of 12 position indexing, whereby each tool may be used in three different working positions is illustrated here. In this application, second operation set-up was eliminated, thus saving 40% in production time.



1 ¾″ square bit mounted in Model 4½-S Turret used to face work.

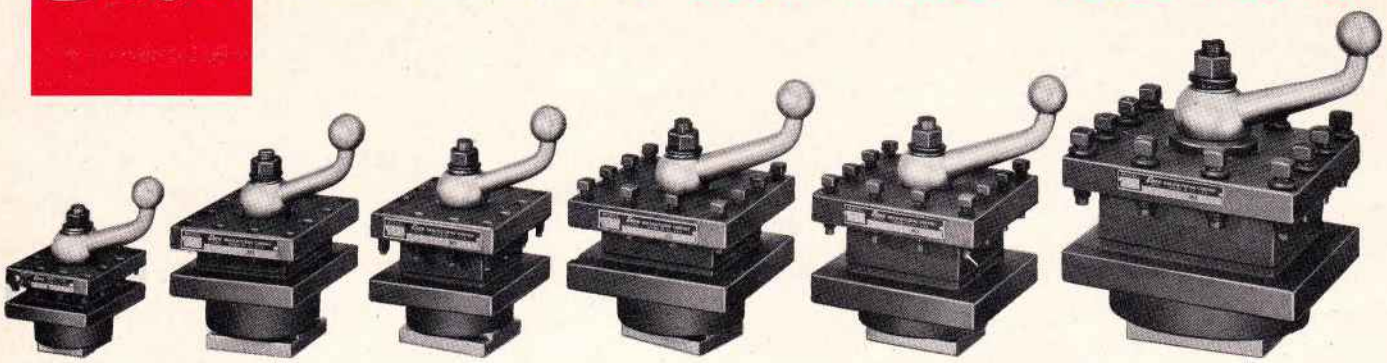


2 Side of tool is used to take a 1″ deep, broad-face turning cut by merely indexing Turret one position, or 30°.



3 Same tool used for inside chamfer by indexing back two positions, or 60°.

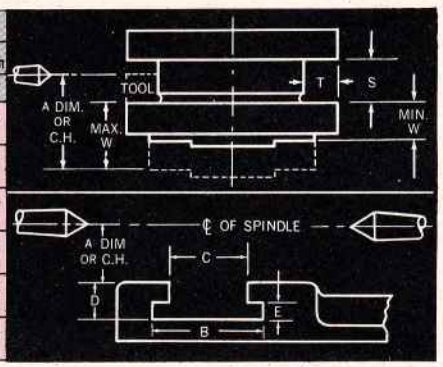
Enco STANDARD T-SLOT TURRET TOOL POSTS



2½-S 3½-S 3½-R 4½-S 4½-R 6-S

Turret Model	"A" Dimension (Center Hgt.) Range	Lathe Swing	TOOL HEIGHT RANGE FOR Solid Tools	H.S.S. Tool Hldr	Carbide Tool Hldr	TOOL BLOCK DIMENSIONS Square	Thick	S	T	"W" Dimension Min.	Max.
2½S	¾" to 1 5/16"	6" to 12"	¼" to ⅜"	—	—	2½"	1¼"	7/16"	⅜"	½"	15/16"
3½S	1 5/16" to 1 13/16"	10" to 13"	⅜" to ½"	#000	—	3½"	1¾"	⅝"	½"	9/16"	1 5/16"
3½R	1¼" to 2⅛"	12" to 15"	⅝" to ⅞"	#0	#T-0	3½"	2¼"	1 1/32"	9/16"	⅝"	1¼"
4½S	1 5/16" to 2 3/16"	13" to 16"	⅝" to ¾"	#0	—	4½"	2¼"	⅞"	1 1/16"	1 1/16"	1 7/16"
4½R	1½" to 2⅜"	15" to 19"	¾" to 1"	#1	#T-1	4½"	2¾"	1 9/32"	1 1/16"	¾"	1⅜"
6S*	1 11/16" to 2¾"	14" to 21"	⅞" to 1¼"	#1 or #2	#T-1 or #T-2	6"	3¼"	1 9/16"	47/64"	13/16"	1½"

*Model 6S is furnished with forged steel block.



GIVE MAXIMUM TOOL SIZE TO BE USED

Enco Standard Turret Tool Posts offer the most economical 12 station indexing turret for lathes with center heights from ¾" to 2¾". Designed to give bench and engine lathes with swings from 6" to 21" greater productive capacity and all-around utility, Enco Standard Turret Tool Posts represent the best value on the market.

To Select a Standard Turret

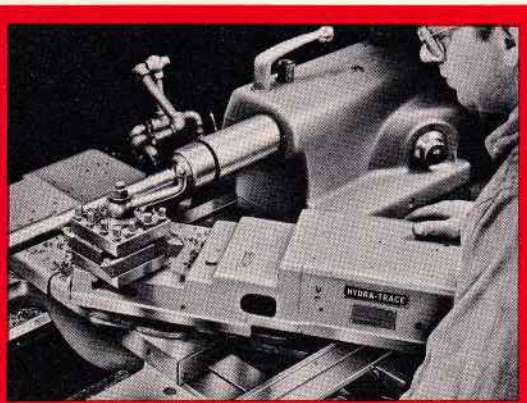
1. Determine "A" dimension (center height) of your lathe.
2. Determine maximum tool height.
3. Select the Turret model, making certain the "A" dimension range and tool height given for the turret correspond to the chart.

   Selection Example:
   16" Engine Lathe. "A" dimension is 1-15/16". Maximum tool size is ¾" x 1".

   (a) Referring to "A" dimension, we have 4 possible choices: 3½R, 4½S, 4½R and 6-S.
   (b) Checking **lathe swing,** we eliminate model 3½R.
   (c) Checking **tool height,** we eliminate the 4½S leaving 4½R and 6-S.
   (d) Checking tool block dimensions, 4½R and 6-S can both use ¾" x 1" solid tool.
   (e) The correct selection would be either:
      1. 4½R for light and medium duty work.
      2. 6-S for heavy work, and if you later plan to use tool holders.
4. If in doubt, refer to Selection Chart by make of lathe on Page 10.

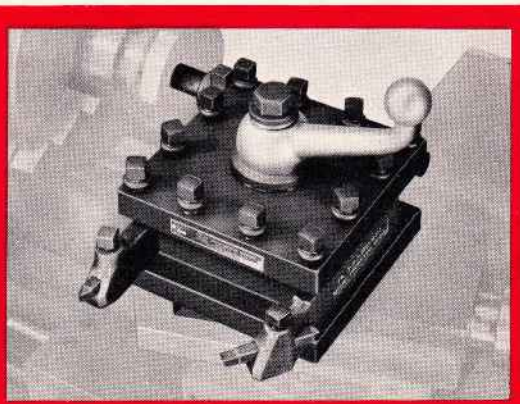
You Can Order An Enco Standard Duty Turret in 2 Ways:

1. **Machined to fit your lathe at no extra cost** by filling in center height, T-SLOT Dimensions and Tool Height on ORDER form. In many cases, **we can ship from stock** Standard Turrets machined to fit current model lathes such as Atlas, Clausing, Logan, Sheldon, Clausing-Colchester, Regal, Hydrashift, South Bend, etc. etc.
2. Machinable Base Turrets are stocked for immediate delivery by leading Industrial Distributors and Machinery Dealers. (On machinable base turrets, lower portion of Center Post, when hardened, is specially treated to permit machining to fit your lathe.)



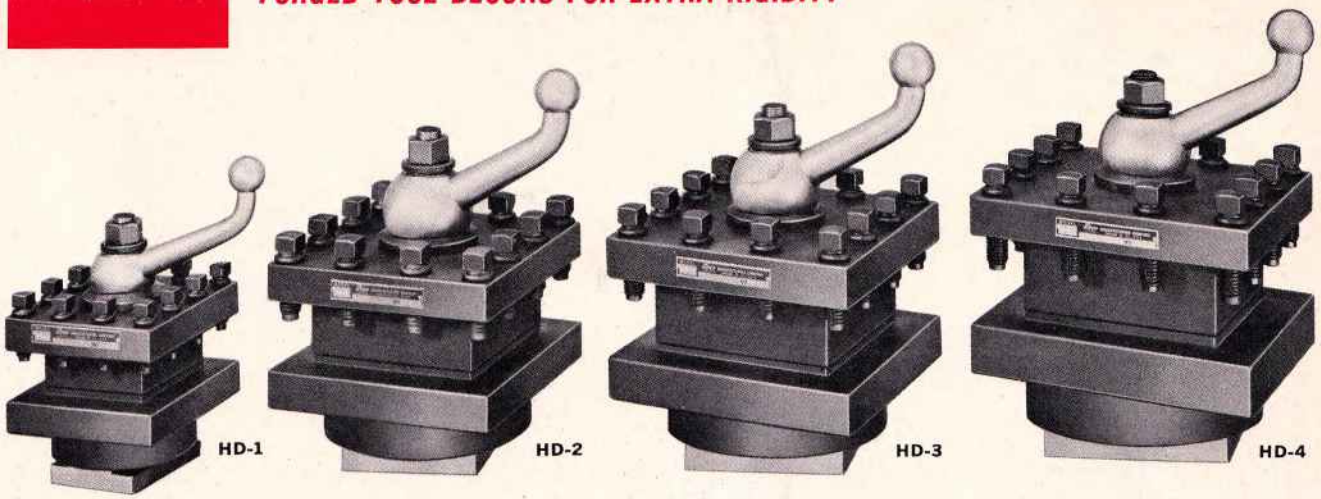
Model 6-S mounted on Tracer slide of a LeBlond Hydra Trace. This allows use of roughing, duplicate finishing tools and in some cases, special form tools. The .0005" guaranteed re-indexing accuracy of Enco turrets results in more accurate Tracer lathe production.

Model 6S tooled with boring bar holder, straight and L.H. #2 H.S.S. toolholders. Job is boring, recessing & turning clutch cone on 16" lathe. Costs were cut 35%.

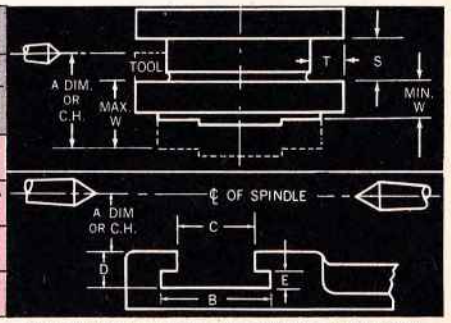


Enco HEAVY-DUTY T-SLOT TURRET TOOL POSTS

FORGED TOOL BLOCKS FOR EXTRA RIGIDITY



Turret Model	"A" Dimension (Center Hgt.) Range	Lathe Swing	TOOL HEIGHT RANGE FOR			TOOL BLOCK DIMENSIONS					
			Solid Tools	H.S.S. Tool Hldr	Carbide Tool Hldr	Square	Thick	S	T	"W" Dimension Min.	"W" Dimension Max.
HD-1	1⅝" to 2½"	13" to 20"	¾" to 1"	#1	#T-1	4½"	3"	1 9/32"	23/32"	⅞"	1½"
HD-2	2" to 3 3/16"	16" to 24"	1" to 1½"	#2 or #3	#T-2 or #T-3	6½"	3¾"	1 25/32"	⅞"	1"	1 11/16"
HD-3	2⅜" to 3 13/16"	18" to 32"	1¼" to 1¾"	#3 or #4	#T-3 or #T-4	7"	4¼"	2 1/32"	1"	1⅛"	2 1/16"
HD-4	2⅞" to 4"	20" to 48"	1½" to 2"	#3 to #5	#T-3 to #T-5	7½"	4¾"	2 9/32"	1⅛"	1⅜"	2"



GIVE MAXIMUM TOOL SIZE TO BE USED

Capable of withstanding the strain of hogging cuts at higher speeds. Proportionately more rugged in construction with correspondingly larger dimensions and capacity. Enco Heavy Duty Turrets further increase the range of a given machine by permitting the use of large size tools. Tool overhang is reduced to a minimum because tools are mounted directly over the base of the Turret.

To Select A Heavy Duty Turret

1. Determine "A" dimension (center height) of your lathe.
2. Determine maximum tool height.
3. Select the Turret model, making certain the "A" dimension range and maximum tool height given for the turret correspond to the chart.

Selection Example:

24" Heavy Duty Lathe. Center height ("A" dimension) is 2½". Maximum tool size is 1" x 1½".

(a) Referring to "A" dimension. we have 3 possible choices: HD-1, HD-2, HD-3.

(b) Checking **lathe swing,** we eliminate Model HD-1.

(c) Checking **tool height,** we have only two possible choices: HD-2 and HD-3.

(d) Checking tool block dimensions, we see that the Minimum "W" dimension for the HD-3 is 1⅛". This eliminates the HD-3 because the 1⅛" Minimum "W" plus the 1½" tool height would put the tool ⅛" above center.

(e) Therefore, the correct selection would be Model HD-2.

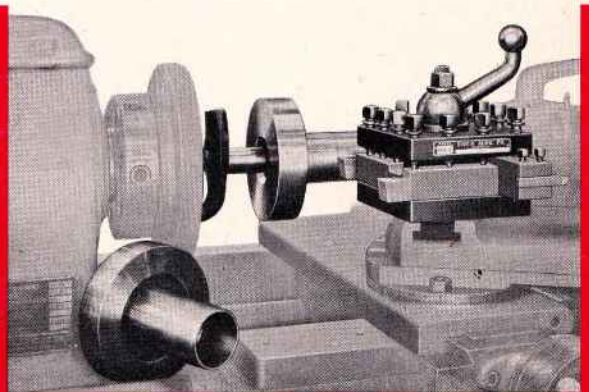
4. IF IN DOUBT, refer to Selection Chart by make of lathe on Page 10.

You Can Order An Enco Heavy Duty Turret in 2 Ways:

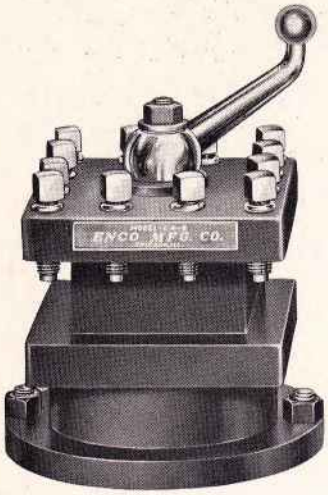
1. **Machined to fit your lathe at no extra cost** by filling in Center Height, T-Slot Dimensions and Tool Height on ORDER Form. In many cases, **we can ship from stock** turrets machined to fit current model lathes such as American, Monarch, Lodge & Shipley, and Mimik Tracers, etc. etc.
2. Machinable Base Turrets are stocked for immediate delivery by leading Industrial Distributors and Machinery Dealers.

   On machinable base turrets, lower portion of Center Post, when hardened, is specially treated to permit machining to fit your lathe.

Photograph shows Model HD-2 at work in a large machine builder's plant. The operations performed are: facing, turning, internal boring and chamfering, recessing and cutting a double pitch thread on an 8640 sulphite forging. A 50% savings in production time was reported.



COMPOUND REPLACEMENT
TURRET TOOL POSTS

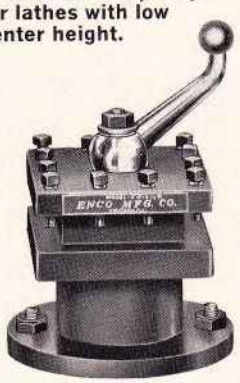


CR-8

- Provides extremely heavy mounting for heavy work.

CR-6

- Greater Tool capacity for lathes with low center height.

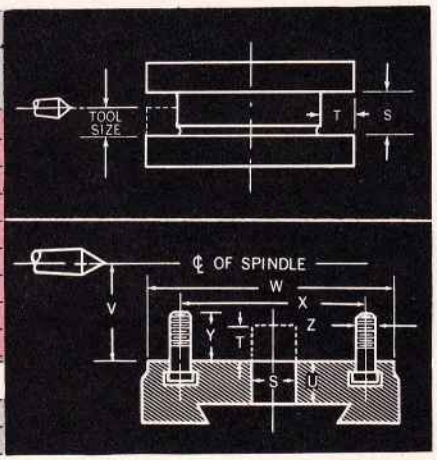


CR-4½R

CR-3½R

Turret Model	Suggested Lathe Swing	TOOL HEIGHT RANGE			TOOL BLOCK DIMENSIONS			
		Solid Tools	Max. H.S.S. Tool Holder	Max. Carbide Tool Holder	Square	Thick	S	T
CR-3½-S	6" to 12"	⅜" to ½"	#000	—	3½"	1¾"	⅝"	½"
CR-3½-R	10" to 13"	⅝" to ⅞"	#0	#T-0	3½"	2¼"	1 1/32"	9/16"
CR-4½-S	10" to 15"	⅝" to ¾"	#0	—	4½"	2¼"	⅞"	1 1/16"
CR-4½-R	12" to 16"	¾" to 1"	#1	#T-1	4½"	2¾"	1 9/32"	1 1/16
CR-HD-1*	13" to 18"	¾" to 1"	#1	#T-1	4½"	3"	1 9/32"	21/32"
CR-6*	14" to 18"	⅞" to 1¼"	#1 or #2	#T-1 or #T-2	6"	3¼"	1 5/16"	47/64"
CR-7*	16" to 22"	1" to 1½"	#2 or #3	#T-2 or #T-3	6½"	3¾"	1 25/32"	⅞"
CR-8*	18" to 27"	1¼" to 1¾"	#3 or #4	#T-3 or #T-4	7"	4¼"	2 1/32"	1"
CR-9*	20" to 48"	1½" to 2"	#3 to #5	#T-3 to #T-5	7½"	4¾"	2 9/32"	1⅛"
SELF-INDEXING CAM LOCKING TURRETS								
CR-3½-C	6" to 12"	⅜" to ½"	#000	—	3½"	1¾"	⅝"	½"
CR-4½-C	10" to 15"	⅝" to ¾"	#0	—	4½"	2¼"	⅞"	1 1/16"

*These models furnished with forged tool blocks.



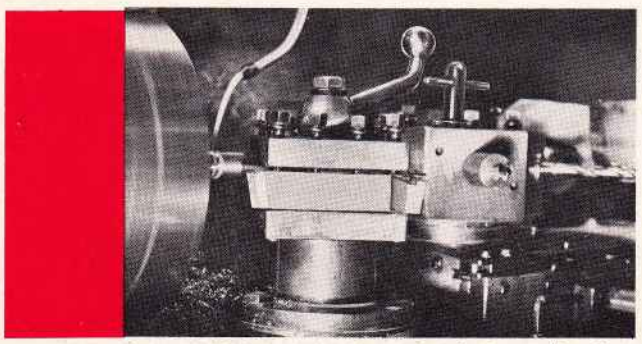
GIVE MAXIMUM TOOL SIZE TO BE USED

Compound Replacement Turrets are designed for use on lathes with low center height where the use of larger and heavier tooling is desirable. Because these Turrets replace the entire compound, they provide a more rigid mounting which permits the use of larger solid tools and tool holders than can be used in Standard or Heavy Duty Turrets, since the lathe center height is not a limiting factor. The Compound Replacement Turret has 12 indexing positions at 30° intervals. This means many angular turning and chamfering jobs can be done faster and easier, by indexing the face or side of the tool into correct position.

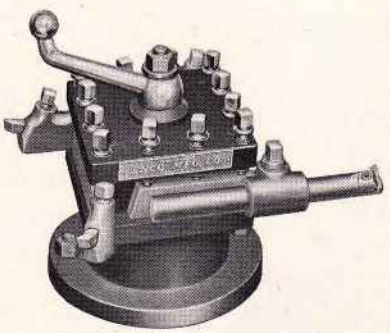
Maximum tool rigidity is achieved when using an Enco Compound Replacement Turret, since movement in the compound, compound gibs, or compound feed screw and nut are eliminated.

TO ORDER A COMPOUND REPLACEMENT TURRET:

Compound Replacement Turrets are custom built to fit your machine. When ordering, requesting quotation or delivery, please supply all dimensions and data shown in Chart on the convenient Order Form.



Model CR-HD-1 tooled with turning, facing, radius form tool and circular form tools. Necking and chamfering also done with facing tool by back indexing 30°. Elimination of compound slide gives more room for bed turret operation plus greater rigidity.



Model CR-6 Compound Replacement Turret Tool Post shown with roughing, turning and boring tools. Compound Replacement Models can mount from ½" to 2" solid tools, or from #0 to #5 tool holders, depending on your selection.

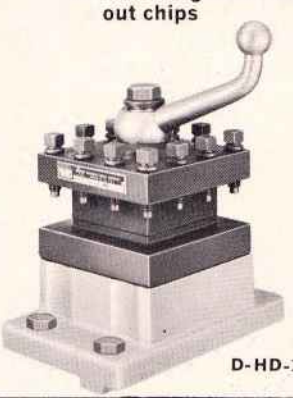
Enco CROSS SLIDE TURRET TOOL POSTS

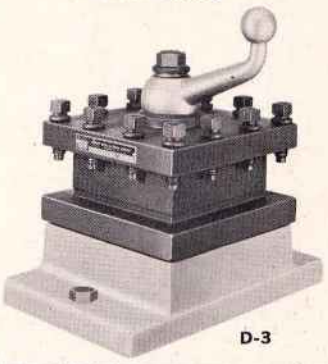
for TURRET LATHES and SCREW MACHINES

- Guaranteed to re-index within .0005″
- 12 station indexing
- "O" Ring Seal keeps out chips
- Save at least $100.00 on each Turret

D-1R

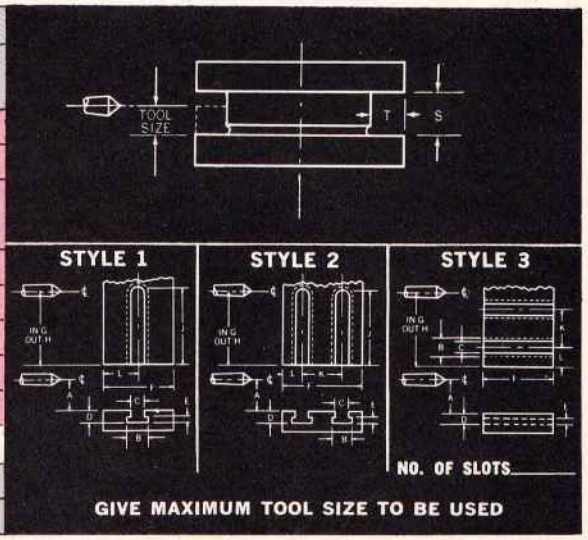
D-2R


D-HD-1


D-3

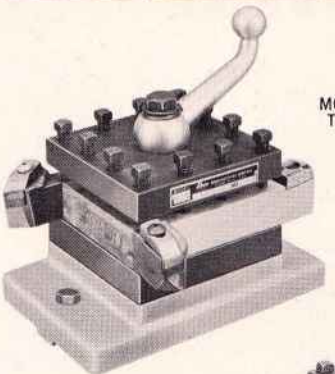
Turret Model	TOOL HEIGHT RANGE			TOOL BLOCK DIMENSIONS			
	Solid Tools	Max. H.S.S. Tool Holder	Max. Carbide Tool Holder	Square	Thick	S	T
D-1	3/8″ to 1/2″	#000	—	3 1/2″	1 3/4″	5/8″	1/2″
D-1R	5/8″ to 7/8″	#0	#T-0	3 1/2″	2 1/4″	1 1/32″	9/16″
D-2	5/8″ to 3/4″	#0	—	4 1/2″	2 1/4″	7/8″	11/16″
D-2R	3/4″ to 1″	#1	#T-1	4 1/2″	2 3/4″	1 9/32″	11/16″
D-HD-1*	3/4″ to 1″	#1	#T-1	4 1/2″	3″	1 9/32″	23/32″
D-3*	1″ to 1 1/4″	#1 or #2	#T-1 or #T-2	6″	3 1/4″	1 9/16″	47/64″
D-4*	1″ to 1 1/2″	#2 or #3	#T-2 or #T-3	6 1/2″	3 3/4″	1 25/32″	7/8″
D-5*	1 1/4″ to 1 3/4″	#3 or #4	#T-3 or #T-4	7″	4 1/4″	2 1/32″	1″
D-6*	1 1/2″ to 2″	#3 to #5	#T-3 to #T-5	7 1/2″	4 3/4″	2 9/32″	1 1/8
SELF-INDEXING CAM LOCKING TURRETS							
3 1/2-CT	3/8″ to 1/2″	#000	—	3 1/2″	1 1/4″	5/8″	1/2″
4 1/2-CT	5/8″ to 3/4″	#0	—	4 1/2″	2 1/4″	7/8″	11/16″

*These models furnished with forged tool blocks.



A new Enco Cross-Slide Turret—fitted to your cross-slide—costs less than any competitive cross-slide turret . . . and in most cases, less than rebuilding your present turret! The .0005″ re-indexing accuracy, plus 12 station indexing means more accurate turret lathe work and greater versatility, i.e. chamfering with a turning tool. The exclusive "O" Ring Seal keeps out abrasive chips and reduces maintenance and down-time.

The 3 1/2-CT and 4 1/2-CT models are self-indexing cam locking turrets. Single action, one-handed indexing increases production by permitting simultaneous bar feeding or cross-slide movement.


MODEL D-2R WITH TOOLS MOUNTED

MODEL 4 1/2-CT

TO ORDER AN ENCO CROSS SLIDE TURRET

Cross-Slide Turrets are custom built with flanged or block base to fit your cross-slide.

Important: When ordering Cross-Slide Turrets, please supply make of lathe, tool height and all dimensions specified on the convenient Order Form.

As an additional aid in selecting the correct turret for your turret lathe, we suggest you refer to the selection chart by make of lathe on page 10.

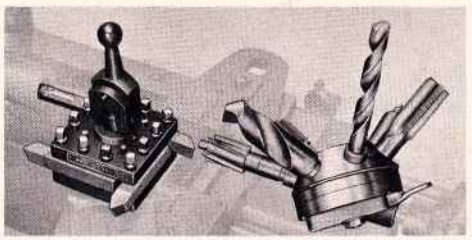
SELF-INDEXING CAM LOCKING TURRET TOOL POSTS

FOR 9" to 18" LATHES

Enco Cam Locking Turrets incorporate all the operating features of other Enco Turrets. The cam lock provides fast, one-hand turret unlocking, indexing, and locking, leaving the operator's other hand free for bar feeding or cross slide movement. The cam locking handle positively locks the turret block in place with slight upward hand pressure.

TO ORDER A 3½-C or 4½-C CAM LOCKING TURRET

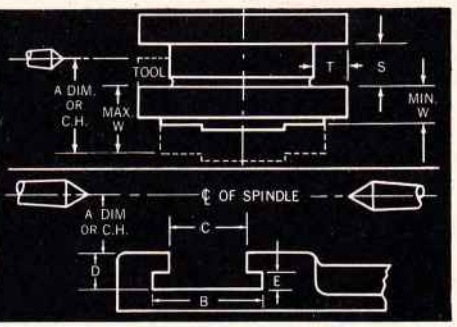
1. Determine "A" dimension (center height) of your lathe and maximum tool height.
2. Select 3½-C if you use ⅜" or ½" maximum tool and center height ("A") is 1⅛" to 1¾". Select a 4½-C if you use ⅝" or ¾" maximum tool and center height is 1⅛" to 2¼".
3. Refer to chart on order form page 11.



Model 4½-C used with Enco Model B Tailstock Turret. Savings of 40% were effected. Tooling can be used on other jobs, and retained as a permanent set-up.

3½-C Size

Turret Model	"A" Dimension (Center Hgt.) Range	Lathe Swing	TOOL HEIGHT RANGE FOR			TOOL BLOCK DIMENSIONS					
			Solid Tools	H.S.S. Toolholder	Carbide Toolholder	Square	Thick	S	T	"W" Dimension Min.	"W" Dimension Max.
3½-C	1 3/16" to 1 13/16"	9" to 13"	⅜" to ½"	#000	—	3½"	1¾"	⅝"	½"	9/16"	1 3/16"
4½-C	1 3/16" to 2⅜"	13" to 18"	⅝" to ¾"	#0	—	4½"	2¼"	⅞"	1 1/16"	1 1/16"	1⅝"



GIVE MAXIMUM TOOL SIZE TO BE USED

CROSS-SLIDE HEXAGON TURRETS

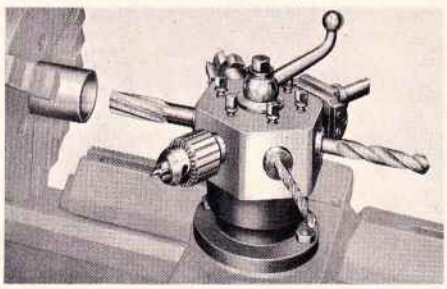
- **Utilize carriage power feed to feed Hexagon Turret**
- **Rigidly holds 6 Tools**
- **Guaranteed .0005" Re-Indexing Accuracy**

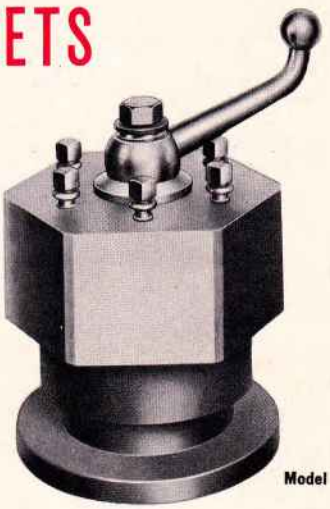
Enco Cross-Slide Hexagon Turrets permit mounting 6 tools on your cross-slide to increase production capacity. Powered by use of the apron feed, these turrets bring advantages of a power operated turret to an ordinary lathe at low cost.

These turrets may be bored out to receive all standard screw machine and turret tools, or flanged type holders may be bolted to the faces. Operations such as drilling, reaming, boring, turning, facing, tapping, die head threading, can be done with the power feed. The hexagon head is blank. Tool mounting holes should be drilled and bored on your lathe to size required, to insure accuracy.

TO ORDER A CROSS-SLIDE TURRET

Supply all dimensions and data specified on the convenient Order Form.

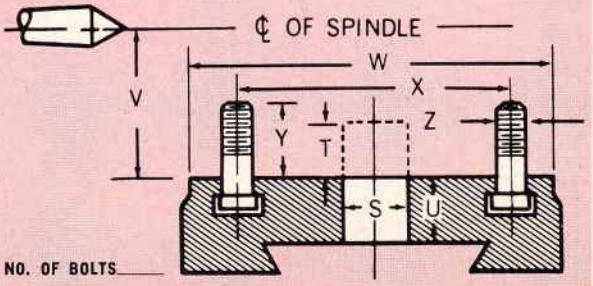




Model CS-6

Model	Recommended Lathe Swing	Tool Hole Capacity	Size of Hex. Across Flats	Hex Head Face Dimensions Width	Hex Head Face Dimensions Height
CS-4	9" to 12"	½" to 1"	5"	2¾"	x 2⅝"
CS-6	12" to 18"	¾" to 1¼"	6"	3¼"	x 3⅜"
CS-8	16" to 28"	1" to 1¾"	7½"	4⅛"	x 4⅛"
CS-10	24" to 40"	1½" to 2"	9"	5¼"	x 4⅜"

NOTE—Give "S" in decimal dim. whether pilot or hole. If hole give only "U" dim. If pilot give only "T" dim. Specify solid tool or toolholder size when ordering.



TAILSTOCK TURRETS

PUT 6 TOOLS TO WORK IN YOUR LATHE TAILSTOCK

ENCO TAILSTOCK TURRETS ARE GUARANTEED FOR 1 YEAR

An Enco Tailstock Turret, will multiply your machine's productive capacity and efficiency up to six times. The availability of six tools for tailstock operations often eliminates the need for second operation work and substantially reduces machine time in piece-part production. Because of their low cost, many users use Enco Tailstock Turrets as special chucks for each job, keeping tooling intact, thus saving set-up time and costs. Enco Tailstock Turrets are as simple to mount in your lathe as a center.

Enco Tailstock Turrets operate under finger tip control. Tool indexing is quick and convenient. Built-in accuracy is ensured by careful manufacturing, with all parts fitted to close tolerances. Both the head and base are machined from Meehanite, a close-grained semi-steel casting ideally suited for the application.

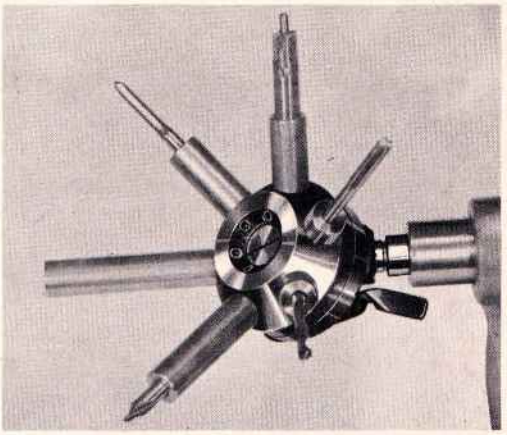
Tool holes are drilled, bored and reamed to plus or minus .001" after the turret is assembled to assure accurate alignment of the tool holes with the Morse Taper shank arbor. All arbors are precision ground so that when the turret is installed in an accurate tailstock, perfect centering of tools will result.

Model B-1 with 1" straight shank arbor is especially recommended for use on turret lathes and screw machines to add tool capacity.

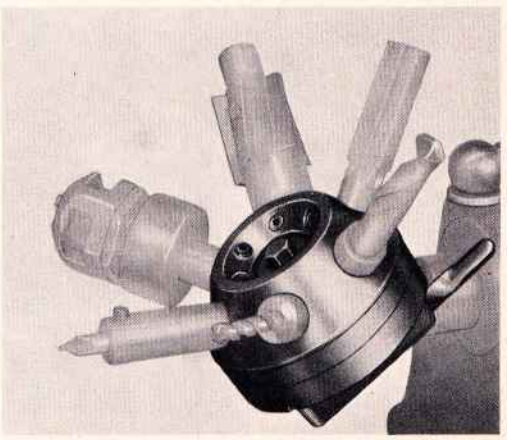
TO ORDER A TAILSTOCK TURRET
Specify Model and Arbor Size. (See Table and use the convenient Order Form.)

IMMEDIATE DELIVERY:—All Enco Tailstock Turrets are carried in stock.

Model	Size of Tool Holes	Available with Arbor Size	Diameter of Head
A	5/8"	#1 or #2 Morse Taper	2½"
B	1"	#2, #3 or #4 Morse Taper	5"
B-1	1"	1" Diameter Straight Shank	5"



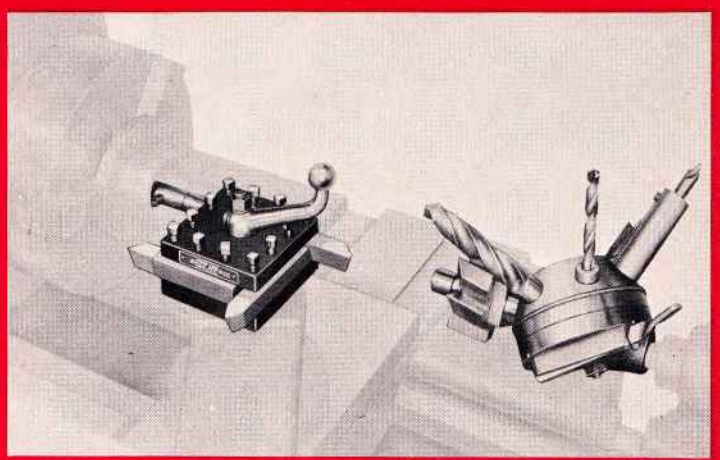
Model A



Model B

MANY USERS GET TURRET LATHE VERSATILITY AT LOW COST BY MOUNTING AN ENCO TURRET TOOLPOST AND A TAILSTOCK TURRET ON THEIR LATHES.

Illustrated at right is a very popular set-up showing Model 4½-S Turret Toolpost used with Model B Tailstock Turret for short run production jobs. This particular application produced savings of 45% in production time. The Turret Toolpost is being used to do an internal threading operation.



Enco TURRET SELECTION GUIDE

for Engine Lathes, Turret Lathes and Tracers
Based on Manufacturer's Current Specifications

Lathe & Swing	Model	Max. Height Solid Tool	Max. H.S.S. Tool Holder
AMERICAN			
14"-B, 16"-C, 20"-D	HD-2	1"	#2
20"-E & 25"-F	HD-3	1½"	#3
25"-G, 32"-H, 32"-I & 40"-J	HD-4	1½"	#3
ATLAS 6"	2½-S	¼"	..
10" & 12"	2½-S	⅜"	..
AXELSON 16"B & 20"W	HD-1	1"	#1
20"D & #2516	HD-2	1½"	#3
25"E & #3419	HD-3	1½"	#3
32"F	HD-4	1½"	#3
BARER-MEUSER MOL 16"	4½-R	¾"	..
MIL 18"	HDC-1	¾"	..
MIIL 18", 20" & 22"	HD-1	¾"	..
MIIIL 24"	6-S	15/16"	..
MIVL 24", 28" & 32"	6-S	1"	#2
CARROLL-JAMIESON 16" & 18"	4½-R	1"	#1
CELTIC 12"	3½-S	½"	
14"	3½-R	¾"	
17"	4½-R	¾"	
20"	HD-1	1"	
CINCINNATI HYDRASHIFT 10"	3½-S	½"	..
12½"	3½-R	¾"	..
15" & 18"	HD-1	1"	#1
21½" & 26"	HD-2	1 7/16"	#3
CLAUSING 10"	2½-S	⅜"	
12"	3½-S	½"	..
CLAUSING-COLCHESTER 13"	4½-S	¾"	
15"	4½-R	¾"	
17"	6-S	1"	
CLOVER 14/20	3½-S	⅜"	..
16/24	4½-S	⅝"	..
17/25	3½-R	⅝"	..
18/27	4½-R	1"	..
20/30	6-S	1"	#2
22/33	HD-2	1¼"	#2
CRAFTSMAN 12"	2½-S	⅜"	..

Lathe & Swing	Model	Max. Height Solid Tool	Max. H.S.S. Tool Holder
DELTA 10"	2½-S	⅜"	..
11"	3½-S	⅜"	..
14"	3½-R	¼"	
ELGIN	2½-S	⅜"	..
GALLIC 14" & 16"		¾"	#1
HARDINGE	3½-S	½"	..
HARRISON 11" & 12"	3½-R	¾"	..
13"	4½-S	¾"	..
17"	6-S	1¼"	#2
LeBLOND DUAL DRIVE	4½-R	1"	#1
LeBLOND HEAVY DUTY			
1610	6-S	1"	..
NE-2013 & 2516	6-S	1¼"	#2
NF-2516 & 3220	HD-2	1¼"	#3
NI-3220 & 4025	HD-3	1¾"	#4
NK-4025 & 5032	HD-4	2"	#5
LeBLOND REGAL			
13" & 15"	3½-R	⅞"	..
17" & 19"	HD-1	1"	#1
21" & 24"	HD-2	1¼"	#2
LEHMANN-BRANDES			
16"	HD-1	1"	#1
18" & 20"	6-S	1"	#2
22"	HD-2	1½"	#3
25"	HD-3	1¾"	#4
32" & 36"	HD-4	1½"	#5
LODGE & SHIPLEY 1307	3½-R	¾"	..
1610	6-S	1"	#2
2013 & 2013-27	HD-2	1"	#2
2516, 2516-27 & 3220	HD-3	1½"	#3
2516 & 2516-21	HD-4	1½"	#3
LOGAN 9", 10", 11" & 12"	2½-S	⅜"	..
14"	4½-R	1"	#1
MONARCH 10"EE	3½-S	½"	..
13" (60 & 61)	HD-1	¾"	..
K-15" Kompact	HD-1	1"	#1
1000EE & 16" (60 & 61)	6-S	1"	#2
20" (60 & 61)	6-S	1¼"	#2
62 Series 1610	HD-2	1"	#2
62 Series 2013	HD-2	1¼"	#2
Model M & 62 Series 2516	HD-3	1¼"	#2
Model N & 80 Series 2516	HD-3	1¼"	#2
80 Series 3220	HD-3	1½"	#3
Model NN—90 Series 4025	HD-4	1½"	#3

Lathe & Swing	Model	Max. Height Solid Tool	Max. H.S.S. Tool Holder
NEBEL 1307	4½-S	¾"	..
2013 & 2516	HD-2	1¼"	#2
SB-2516-20 & HXB-26/45	HD-2	1¼"	#2
RIVETT 60 Series	3½-S	½"	..
918S	2½-S	⅜"	..
1020S	3½-S	½"	..
ROCKFORD 16 & 18 HX	HD-1	¾"	..
SHELDON 10", 11" & 13"	3½-C	½"	..
15"	HD-1	¾"	..
SHELDON-SEBASTIAN 13"	4½-S	¾"	..
15"	HD-1	¾"	..
SIDNEY 1307	3½-R	¾"	..
169, 1812 & 2013	HD-2	1"	#1
2214 & 2516	HD-2	1¼"	#2
2717	HD-3	1½"	#3
3419	HD-4	1¾"	#5
SOUTH BEND 9" & 10"	2½-S	⅜"	..
13"	3½-S	½"	..
14½" & 16"	4½-S	¾"	..
17"	6-S	1¼"	#2
SIGMA SN20A	4½-S	¾"	..
SV18R-15	4½-R	1"	#1
SN4016, 4518 & 5020	HD-1	¼"	
SN55-22", 63-25", 71-28"	HD-2	1¼"	#2
SPRINGFIELD 14" & 16"	6-S	1"	#2
18", 20" & 24"	HD-2	1½"	#3
22"	HD-4	1¾"	#3
30"	HD-4	1½"	#3
STANDARD-MODERN 10"	3½-S	½"	..
12"	4½-S	¾"	..
14" & 16"	HD-1	1"	#1
VDF (McDougall)			
VDF 18 RO & 36 D, D, L	3½-R	⅝"	..
21 RO, 24 RO & 44 D, S, L	4½-R	15/16"	..
E3, E3H & S450	6-S	1¼"	#2
V3, V3H & S500	6-S	1¼"	#2
E5	HD-2	1 7/16"	#3
V5 & V6	HD-3	1¾"	#4

Enco builds the world's most complete line of turrets and the above selection chart is a guide to help you select the correct Enco Turret. When tool size is not shown with your order, turret will be built to center maximum standard tool height.
When the turret and tool height you want are not shown on the above chart, we suggest:

1. If your lathe is not shown, please fill in the appropriate dimension chart on convenient order form following this page.
2. If you still have any questions, please write us.

TRACERS

Make of Tracer	Model	Max. Height Solid Tool	Max. H.S.S. Tool Holder
MIMIKETTE #2	2½-S	⅜"	
#4	3½-R	¾"	
#6	4½-R	¾"	
MIMIK 9000 3	4½-R	¾"	
#4	6-S	1"	
#5	6-S	1"	
#6	HD-2	1¼"	
#7	HD-2	1¼"	
#8	HD-4	1½"	
#9	HD-4	1½"	
#10	HD-4	1½"	
#11	HD-4	1½"	
TRUE TRACE OR TURCHAN	*Fill in chart on next page*		

TURRET LATHES

When ordering Cross-Slide Turrets, please supply make of lathe, tool size and dimensions shown on the convenient Order Form.

Lathe & Swing	Model	Max. Height Solid Tool	Max. H.S.S. Tool Holder
BARDONS & OLIVER #2	D-2R	1"	..
#3	D-HD-1	1"	..
#5	D-3	1¼"	#2
#7 & #9	D-5	1½"	#3
CLAUSING	D-1	½"	..
DELTA	3½-CT	½"	..
DENVER ACME 6.2	D-5	1½"	#3
GISHOLT #3	D-3	1¼"	#2
#4	D-4	1½"	#3
#5	D-4	1½"	#3
JONES & LAMSON #3, #5 & #7A	D-4	1½"	#3
LOGAN 10"	D-1	½"	..
11" & 12"	D-1R	⅝"	..

Lathe & Swing	Model	Max. Height Solid Tool	Max. H.S.S. Tool Holder
MIDLAND #4	D-3	1¼"	#2
#5	D-4	1½"	#3
MOREY #2	D-2R	1"	..
#3	D-3	1"	..
#4	D-3	1¼"	#2
OSTER #601	D-2R	1"	..
SHELDON #3R	D-HD-1	1"	..
SIMMONS #2	4½-CT	¾"	..
SOUTH BEND 10"	D-1	½"	..
13"	D-2	¾"	..
16"	D-HD-1	1"	..
WARNER & SWASEY #1	D-1R	⅝"	..
#2	D-2R	1"	..
#3 & #4	D-HD-1	1"	..
#5 & #6	D-3	1¼"	#2

Enco PRICE LIST and ORDER BLANK

(May be filled out and attached to purchase order if desired)

Date:_____

Please enter our Order #_____ for the Enco Products indicated below.

FIRM_____

ORDERED BY_____ (Signature) TITLE_____

BILLING ADDRESS_____ CITY_____ ZONE_____ STATE_____

SHIPPING ADDRESS_____ CITY_____ ZONE_____ STATE_____

NAME OF YOUR DISTRIBUTOR_____

ADDRESS OF YOUR DISTRIBUTOR_____

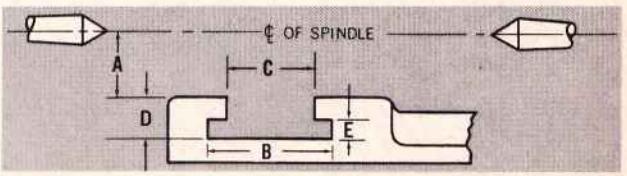
NOTE: When ordering Enco Turrets machined to the dimensions of your lathe, please give all dimensions and data shown in appropriate section below.

WHEN ORDERING MACHINABLE BASE T-SLOT TURRETS or TAILSTOCK TURRETS, indicate Model and/or Taper Size.

- **ALL ENCO PRODUCTS ARE GUARANTEED for 1 year after date of purchase. A guarantee Certificate is enclosed with each Enco Product.**
- **A Parts Price List and Suggestions for care and use are enclosed with each Enco Product.**
- **Enco Manufacturing Company**
  4520 W. Fullerton Ave.
  Chicago, Illinois 60639, U.S.A.
  Telephone Area Code 312—227-6200

Name of Product	Page No.	Enco Model	How Many	Price Each	Total Price
STANDARD T-SLOT TURRET TOOLPOSTS	4	2½-S		$ 39.00	
		3½-S		61.00	
		3½-R		76.00	
		4½-S		83.00	
		4½-R		102.00	
		6-S		175.00	
HEAVY DUTY T-SLOT TURRET TOOLPOSTS	5	HD-1		155.00	
		HD-2		225.00	
		HD-3		265.00	
		HD-4		305.00	
SELF-INDEXING CAM LOCKING TURRET TOOLPOSTS	8	3½-C		94.00	
		4½-C		122.00	
COMPOUND REPLACEMENT TURRETS	6	CR-3½S		117.00	
		CR-3½R		132.00	
		CR-4½S		148.00	
		CR-4½R		167.00	
		CR-HD-1		240.00	
		CR-6		263.00	
		CR-7		335.00	
		CR-8		393.00	
		CR-9		460.00	
SELF-INDEXING COMPOUND REPLACEMENT TURRETS	6	CR-3½-C		150.00	
		CR-4½-C		187.00	
CROSS-SLIDE HEXAGON TURRETS	8	CS-4		235.00	
		CS-6		295.00	
		CS-8		375.00	
		CS-10		415.00	

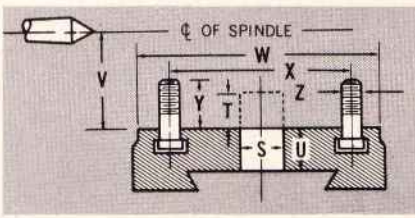
Ordering Specifications



Make of Lathe and Size	A	B	C	D	E	Maximum Tool or Toolholder Size To Be Used

When ordering turrets for use with toolholders specify whether for H.S.S. or Carbide Bits.

When ordering please specify maximum tool size to be used.



NOTE
Give "S" in decimal dim. whether pilot or hole. If hole give only "U" dim. If pilot give only "T" dim.
Specify solid tool or toolholder size when ordering.

Make of Lathe and Size	S	T	U	V	W	X	Y	Z	No. of Bolts	Maximum Tool or Toolholder Size To Be Used

When ordering turrets for use with toolholders specify whether for H.S.S. or Carbide Bits.

When ordering please specify maximum tool size to be used.

Cut along this line

All Prices are F.O.B. our Plant in Chicago. Prices subject to change without notice.

Printed in USA

Enco PRICE LIST and ORDER BLANK

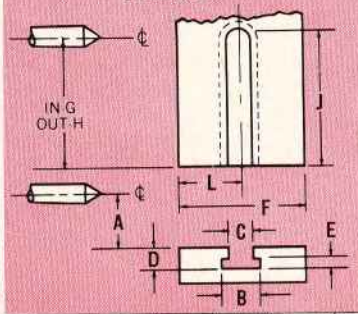
SCREW HANDLE CROSS-SLIDE TURRET TOOLPOSTS and SELF-INDEXING CROSS-SLIDE TURRETS

Page No. 7

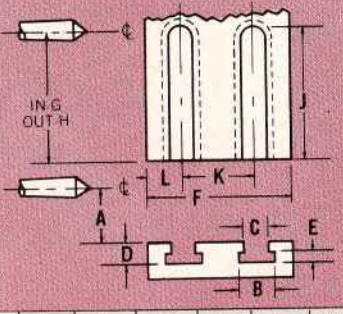
Name of Product	Enco Model	How Many	Price Each	Total Price
	D-1		$104.00	
	D-1R		119.00	
	D-2		144.00	
	D-2R		163.00	
	D-HD-1		240.00	
	D-3		262.00	
	D-4		$314.00	
	D-5		368.00	
	D-6		435.00	
	3½-CT		138.00	
	4½-CT		183.00	

Select style at right which corresponds to the front of your cross-slide and fill in dimensions completely. If other than styles shown submit equivalent information. When ordering turrets for use with toolholders specify whether for H.S.S. or Carbide Bits.

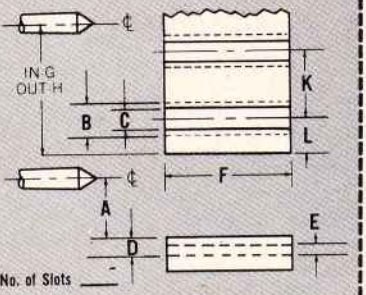
STYLE 1



STYLE 2



STYLE 3



Give No. of Slots ____

Make and Size of Lathe	A	B	C	D	E	F	G	H	I	J	K	L	Maximum Tool or Toolholder Size To Be Used	Style of Cross-slide

TAILSTOCK TURRETS

Page No. 9

Enco Model	How Many	Price Each	Total Price
A—With No. 1 Morse Taper Arbor and 5/8" Tool Holes		$38.00	
A—With No. 2 Morse Taper Arbor and 5/8" Tool Holes		38.00	
B—With No. 2 Morse Taper Arbor and 1" Tool Holes		67.00	
B—With No. 3 Morse Taper Arbor and 1" Tool Holes		67.00	
B—With No. 4 Morse Taper Arbor and 1" Tool Holes		69.00	
B-1—With 1" Straight Shank Arbor and 1" Tool Holes		69.00	

ENCO TINY-TITAN® MAGNETIC BASE TOOLS

Pages 16 and 17

NOTE: For prices on new magnetic tools see front and back covers.

Enco Model	How Many	Price Each	Total Price
100		$10.70	
120		15.65	
125*		4.95	
130		12.80	
150		19.20	
155*		3.30	
160		21.40	
200		11.20	
2002*		$ 2.00†	
2013*		2.00†	
220		21.35	
250		21.90	
500		13.00	
1002*		6.65	
1502*		10.80	

*Accessories †Carton of 4

MICRO-SET ADJUSTABLE CENTER

Page 18

Enco Model	How Many	Price Each	Total Price
MORSE TAPER			
Size: #2		$49.50	
#3		61.50	
#4		76.00	
BROWN & SHARPE TAPER			
Size: #6, #7		53.00	
#8, #9		65.00	
#10, #11		85.00	
JARNO TAPER			
Size: #6, #7		$53.00	
#8, #9		65.00	
#10, #11, #12		85.00	
STRAIGHT SHANK			
Size: ¾"		56.00	
1"		68.00	
1¼", 1½"		80.00	

For special centers or SIZES not shown, write for quotation, giving necessary information.

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Name of Product	Page No.
SELF-INDEXING HEXTURRETS (PILOT WHEEL)	14-15

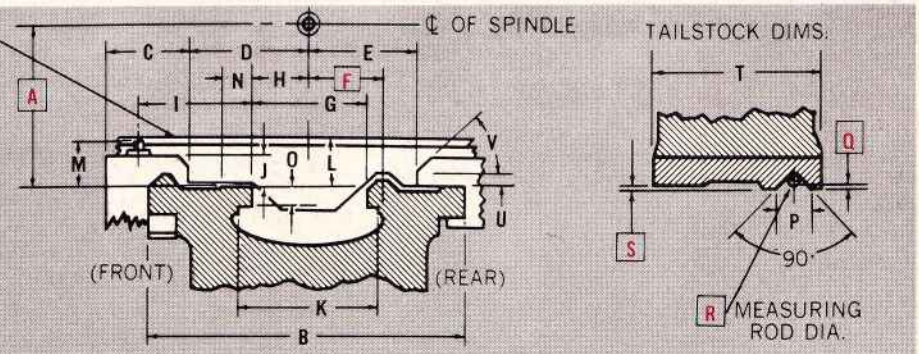
Lathe Make	Swing	Model No. 425	Model No. 651	Model No. 650
American	14"			$695
Atlas	10" or 12" (Craftsman 12)	$395 395	$450 450	
Celtic	12" 14" 17" 20"	445	490	600 635 655
Carroll-Jamieson	15" 16" 18"			575 600 655
Cincinnati Hydrashift	10" 12½" 15" 18"	$445 445	$515 515	$550 585 630
Clausing	10" 12"	395 400	450 455	525
Clausing-Colchester (Specify gap bed or straight bed lathe)	13" 15" 17"	445 475	490 535	525 570 620
Delta	10" and 11" 14"	395	450	550
Harrison	11" 12" 13" 16"	415 440 440	460 495 505	550 645
Hercules	14"			585
LeBlond	12" 14" 16" (Dual Drive) 15"			595 620 665 580

Lathe Make	Swing	Model No. 425	Model No. 651	Model No. 650
LeBlond Regal	13" 15" 17" 19"	450	515	$550 580 600 630
Lodge & Shipley	10" "Hiturn 12" 14" 16"	460	530	555 590 620 665
Logan	9" 10", 11" 12" 14"	375 395 400 450	425 450 455 490	525 550
Monarch	10" 13" "C" 14" "K" 16"	415	495	535 590 620 620 645
Rockford	14" 16" 18"			605 630 660
Saimp	12" 14"	440	505 535	570
Sheldon-Sebastian	13" 15"	430	495	535 570
Sheldon	10", 11" 13"	395 410	450 465	535
South Bend	9" 10" 13" 14½", 16" 17"	380 395 430	424 450 500	545 580 600
Standard Modern	12" 14" 16"	415	500 560	570 595 645

NOTE: This is only a partial listing. ENCO Hexturrets can be supplied for other lathes from 9" to 17" swing. Fill in chart below when writing for quotation.

Enco Model Hexturret (Specify Lathe and Swing)	How Many	Price Each	Total Price

FOR MODELS #425, #651 & #650 HEXTURRETS



NOTE— Dimensions shown in rectangular boxes should be accurately measured preferably in decimals to insure proper mounting.

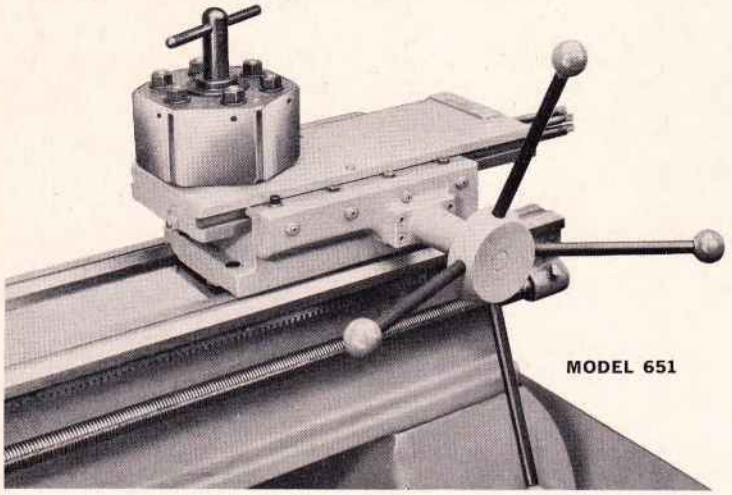
Lathe and Swing	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V

*Dimensions A, F, Q, R, & S should be given in decimals.

Cut along this line

SELF-INDEXING HEXTURRET with _____

CONVERT YOUR ENGINE LATHE TO A HAND TURRET LATHE AT LOW COST



MODEL 651

IMPROVE PERFORMANCE, INCREASE PRODUCTION OF A NEW OR OLD LATHE

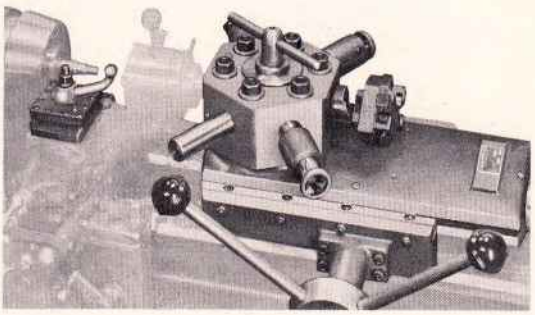
ENCO HEXTURRETS ARE GUARANTEED FOR 1 YEAR

Add a Enco Hexturret to your lathe and get turret lathe performance and production at modest cost. With an Enco Hexturret on your lathe, you can perform all operations normally done on a turret lathe or hand screw machine including drilling, counterboring, countersinking, spot facing, reaming, turning, etc.

Enco Self-Indexing Hexturrets are designed and built for heavy duty, high production work. The exclusive double rack and pinion drive provides equalized feed and ensures accuracy, even under heavy feed pressures.

WHEN ORDERING AN ENCO HEXTURRET:

1. Specify whether you want to order Model 425, 651 or 650.
2. Specify make and swing of lathe.
3. When ordering, please send lathe dimensions as shown on the ORDER FORM



Special shoulder screw being machined on a popular 10" lathe equipped with our Model 425 Hexturret and our Model 2½-S Turret Tool Post. Quantities of only 150 pieces were required of each of four different size screws. All tooling used was standard and class #3 fit was required for threaded end. Tolerances on length of step were held to plus .002" minus .000" and diameter was held to plus or minus .0005".

HEXTURRET SPECIFICATIONS

Model	Recommended Lathe Swing	HEXAGON HEAD DIMENSIONS			Tool Hole Size Hexagon Head Can Be Bored To	Slide Length	Total Slide Travel	Working Travel of Slide	Base Length	Diameter of Tool Clearance Over Slide
		Across Flats	Face Dimensions							
			Height	Width						
425	9" to 13"	5⅝"	2⅞"	3"	⅝" to 1"	14¼"	5¼"	4¼"	11¾"	10"-11" swing 3⅛" 12"-13" swing 3⅜"
651	9" to 13"	5⅝"	2⅞"	3"	⅝" to 1"	16½"	7½"	6½"	11¾"	10"-11" swing 3¼" 12"-13" swing 3¾"
650	12" to 16"	7"	3⅜"	3⅞"	1" to 1½"	16½"	7½"	6½"	11¾"	12" to 16" swing furnished with quotation

Additional Specifications

Hexagon head is furnished blank and tool holes are to be bored or reamed by customer on his lathe to insure proper alignment. Soft tool shank locks are bored at same time. Size of tool holes that can be bored are shown in chart above. Mounting holes for flanged tools must be drilled and tapped to suit tools used.

The hexagon head face dimensions on 9" lathes only, is 2⅝" x 3" and tool clearance over slide is 2⅝" dia.

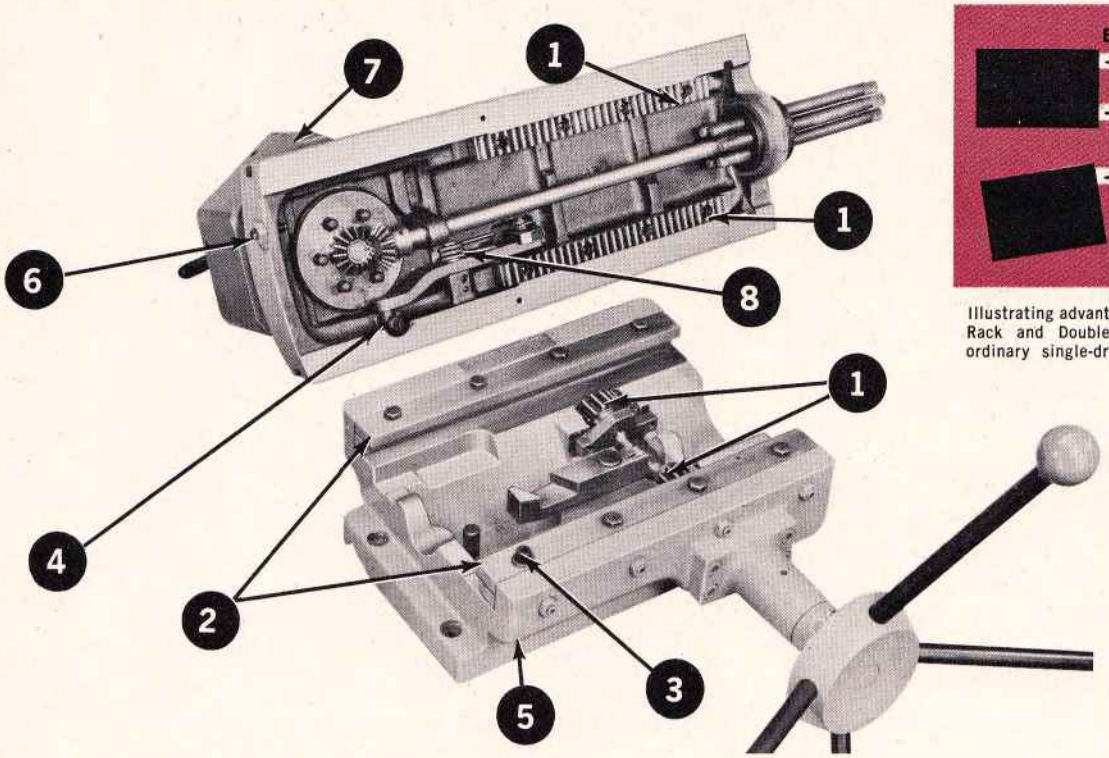
The difference between total slide travel and working travel is the distance required for indexing the turret head.

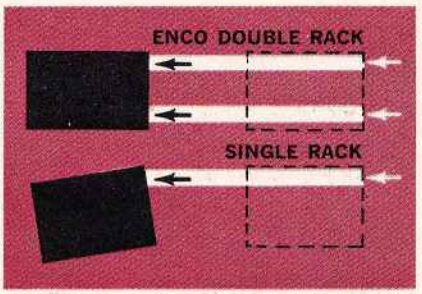
CUSTOM BUILT TO FIT

Enco Self-Indexing Hexturrets are custom built to fit all lathes from 9" to 16" actual swing, regardless of age or make of machine. See Specification Drawings on order form. These Hexturrets may also be fitted to old turret lathes and screw machines up to 16" swing, giving you better performance from your obsolete machines.

EXCLUSIVE DOUBLE RACK & DOUBLE GEAR DRIVE

for EQUALIZED FEED and PRECISION WORK





Illustrating advantage of Enco's patented Double Rack and Double Gear Drive compared with ordinary single-drive. See 1 below.

1. Double rack and gear drive equalizes tool feed pressure, gives smooth, parallel slide travel and minimizes torsional strain as load is equally divided, even under heavy cuts. This results in cleaner, more precise work.

2. Two-piece adjustable gibs, front and rear, provide lateral adjustment for slide travel.

3. Gib lock provided for work on center or for recessing, necking, or grooving operations from turret.

4. Indexing precision is assured by hardened and ground tapered seat bushings in the turret head. Into these bushings locates the hardened and ground tapered nose index pin, which in turn, reciprocates in a full bearing sleeve. This extra long sleeve is hardened, ground and lapped to ensure accurate guiding of index pin and precise location of turret head. All of these parts are made and fitted to extremely close tolerances and are replaceable when worn.

5. The turret base is constructed to clear the wings of the lathe carriage. This permits the turret to be moved close to the headstock for collet work or to perform facing operations from the compound or cross-slide when necessary.

6. Safety stop screw prevents over-ride of head positioning. Also keeps slide from returning too far on back stroke preventing possible injury to mechanism.

7. The hexagon head revolves in an aluminum bronze bearing in the slide having a tensile strength of 90,000 p.s.i.

8. Lever action spring which locates index pin into index bushings thru trip lever, is so designed that constant pressure is exerted in holding hex head in proper position. Longer spring life is attained than thru use of compression springs.

ADDITIONAL FEATURES

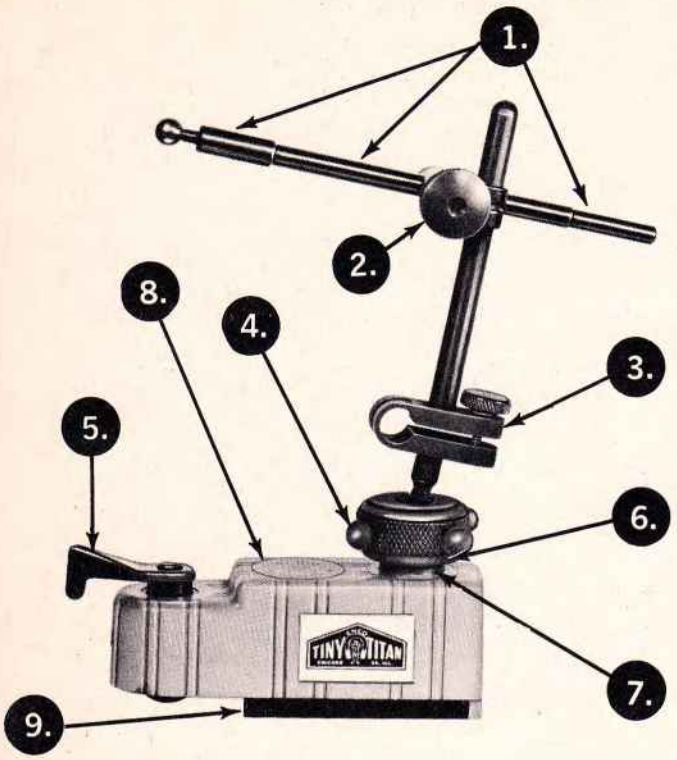
- Hexagonal head design permits mounting 6 flanged tools or tool holders.
- All bearing surfaces on base, gibs and slide are precision ground and fitted.
- Double external clamping screws at each end of base eliminate crawling or slipping under heavy cuts. Turret base screws are clamped from top, not from under the ways, for easy positioning and secure locking.
- Hardened, automatically indexing stop screws.
- All levers, trip blocks and indexing block hardened for wear and stability.
- Pilot spoke design gives positive control and smooth operation of the slide. The 14 to 1 mechanical advantage of the pilot wheel means less operator fatigue.
- Soft large tool shank locks which are bored out when tool holes are bored, give positive gripping of tool shanks without indenting shanks. Tool holes can be bored out for any standard size shank as shown in specifications.
- For heavy work or interrupted cuts requiring extra rigidity, only a quarter turn of the handle is required to lock turret head solidly. For normal concentric work, the spring loaded turret is sufficiently rigid with the locking handle open.
- The step construction of the turret head and slide minimizes the possibility of chips working in between the head and slide.
- In making every effort to offer you a precise long lasting bed turret all castings are heat treated to ensure stability.

Enco

ENCO TINY TITAN TRADE MARK

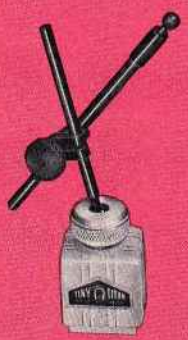
MAGNETIC BASE TOOLS...

COMPACT . . . STURDY . . . VIBRATION-PROOF . . .



EXCLUSIVE FEATURES:

1. Single Universal Rod, exclusive on all Enco indicator Holders, has 3 diameters (7/32", 1/4", 5/16") to permit mounting popular indicators without changing rods. Saves time looking for right rod to fit indicator.
2. Swivel Adapter (on Indicator Holders) provides full 360° adjustment.
3. Precision Adjustment Stem (on Nos. 130 and 160) with fine adjustment screw permits extremely fine movement of stem for zeroing indicator dial.
4. Capstan-spoke Adjusting Nut (on Duplex Models) provides quick, positive finger grip for tightening ball joint.
5. Quarter turn of jack-type release lever (on Duplex Models) breaks magnetic pull for easy removal or re-location. Lifting cam retracts flush with bottom, permits full magnet contact mounting on rounds down to 3/4".
6. Ball seat is silver brazed directly to the pole piece for permanent anchorage and lifetime rigidity (not just imbedded in plastic). Ball on stem is spherically machined for full friction area and secure locking of ball joint.
7. Non-magnetic ball seat and spring, prevent magnetism traveling from base to indicator.
8. Non-breakable, high visibility Tenite plastic base.
9. Heavier Magnetic Pull (125 lbs. on Duplex Models, 65 lbs. on smaller models) ensures tight, vibrationproof mounting on flat surfaces and down to 3/4" rounds. Permanent Alnico magnets are the strongest made.



Model 100 Magnetic Base Indicator Holder for smaller indicators such as Starrett, Brown & Sharpe, Gem, Lufkin. Includes 3-Diameter Rod and Swivel Adaptor.

Model 130 Magnetic base indicator holder with precision adjustment for zeroing indicators. Other features same as #100.

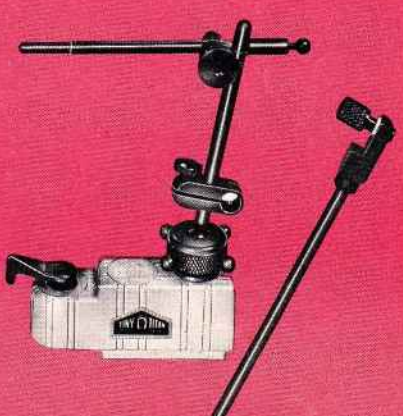
Model 120 Combination magnifier and indicator holder. Fitted with 5X magnifier, non distorting at 2" focal distance. Other features same as #100.

TO ORDER

A. Please specify:
   1. Model required
   2. Quantity

B. Use the convenient Order Form when mailing your order.

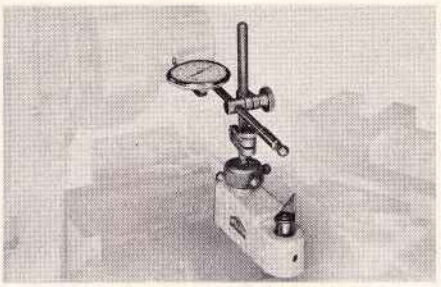
Model 150 Heavy duty magnetic base indicator holder for indicators up to 3" diameter. Includes 3-Diameter Universal Rod, offset clamp for lug-back indicators and swivel adaptor.



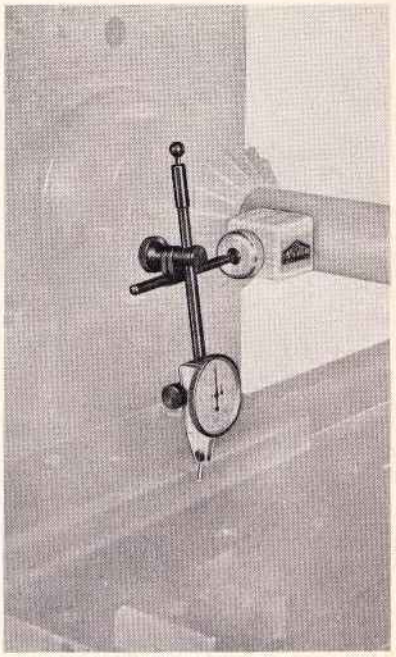
Model 160 Heavy duty magnetic indicator holder with precision adjustment for zeroing indicators (featured in the above illustration). Other features are the same as the #150.

GUARANTEED 65 and 125 lb. MAGNETIC PULL

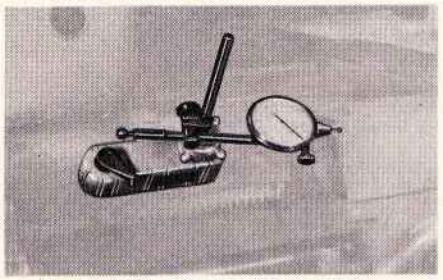
Model #220 Combination Magnifier and Light is made to order for tool, die and mold work. Photo shows ball end mill being honed to gage with diamond hone, using 5X magnification and light to get precise contour.



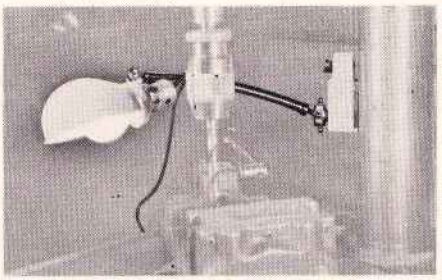
Model #160 with precision adjustment mounted on lathe carriage used to set up eccentric fixture. Rigid mounting and precision adjustment gives fast accurate set-up.



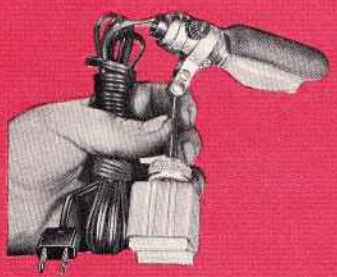
Model #100 mounted on cutter arbor used to align milling fixture in milling machine. Ease of mounting on round as well as flat surfaces makes these tools indispensable.



Model #150 with indicator mounted used as a precision lathe stop to give repetitive shoulder length.



Model #250 Portable Magnetic Base Light can be quickly attached to any machine or fixture to provide pin-point lighting where needed.



Model 200 Magnetic base handilite. Comes with non-glare 25 watt and 40 watt bulbs. Gives pin-point lighting. Ideal for pantographs and close die work.
6 ft. oil resistant U.L. approved cord. Rayon flocked shade protects user from burns.
Lamp bulbs for #200 and #220 lights.
#2013 25 watt non-glare (packed 4 to a carton)
#2002 40 watt non-glare (packed 4 to a carton)

Model 220 Combination magnifier, light and indicator holder. A 3-way tool combining the features of #100, #120 and #200. An extremely economical and versatile unit.

Model 155 Hardened and ground steel surface plate shoe. Mount the shoe on the base of Model 150 or 160 and use as a surface gage on steel, marble, or glass surface plates.

Model 250 Heavy duty magnetic base lighting unit. Takes standard bulbs up to 100 watt. Spoke adjusting nut, heavy duty flexible arm and 125 pound magnetic pull permit easy adjustment and vibration proof setting. Ideal for use on punch presses, milling machines, etc., and as a portable light for repair or maintenance work. Flocked shield protects user against burns. 8 ft. oil resistant, U.L. approved cord, rubber plug.

Model 500 Portable demagnetizer, demagnetizes tools, parts, pieces, etc. Small enough to go in cavity of die cast molds, in punches of stamping dies, etc. Press switch with finger to operate unit, releasing shuts off unit 110 volts A.C. Three laminated silicon steel poles in bottom flush with case.

Model 125 5X magnifier non-distorting 2" focal length. Use with all Enco 100, 130, 150, 160, 300. Also can be used with surface gage to inspect small parts, read Vernier scale, etc.

Model 1002 used on Models 100, 120, 130, 200, 220. Yellow unbreakable Tenite plastic 1¼" x 1 7/16" x 1½" high.

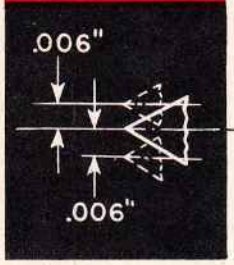
Model 1502 Heavy duty magnet assembly used on Models 150, 160, 250. Green unbreakable Tenite plastic 1¼" x 4" x 1⅝" high.

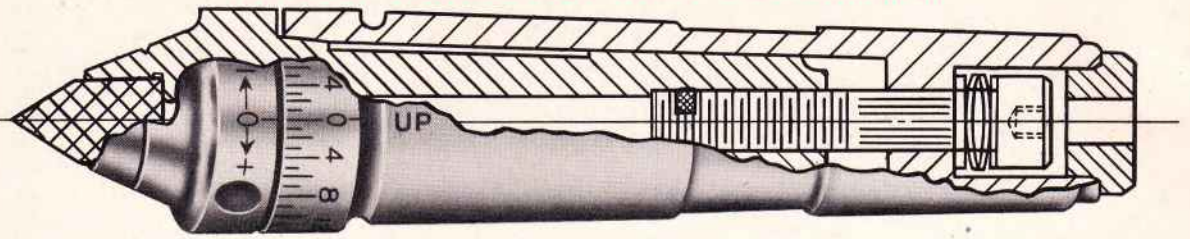
Enco

Micro-Set®

ADJUSTABLE CENTER...for Lathes & Grinders

REDUCES WORK SET-UP TIME TO A MINIMUM





ENCO MICRO-SET ADJUSTABLE CENTERS ARE GUARANTEED FOR 1 YEAR

- **TRUE alignment from tailstock to headstock on NEW or WORN cylindrical grinders, gear shavers, lathes and tracer attachments.**
- **Quick, ACCURATE correction from tenths to .012″ on straight or taper work.** • **Ends hit or miss table or tailstock adjustments.**
- **Aligns work on centers in increments of .0005″ on diameter of work.** • **Replaceable carbide tip.**
- **On dead spindle grinders, the center can be used in the headstock along with a half center in the tailstock for small work requiring wheel clearance.**
- **Any operator gets precise alignment easily in seconds.** • **Quickly pays for itself in time and scrap savings.**

Trueing work between centers for straight or taper work on lathes and grinders is a fast, easy job with the ENCO MICRO-SET Adjustable Center. Total tip movement in either direction is .006″ which results in .012″ correction on the diameter of the work. Calibrations on the sleeve indicate correction on diameter of work.

CONSTRUCTION—The Micro-Set Adjustable Center is ruggedly built. Chips, dirt or coolant cannot enter or affect the internal mechanism. The sleeve and arbor are precision ground and lapped to each other and held in metal-to-metal contact to a holding and releasing taper by a shake-proof screw and spring. This prevents movement of the tip once it is set in the desired position. The Center is fitted with a replaceable carbide tip.

AVAILABLE FROM STOCK

MORSE TAPER Size	BROWN & SHARPE Size	JARNO Size	STRAIGHT SHANK Size
#2	#6, #7	#6, #7	¾″
#3	#8, #9	#8, #9	1″
#4	#10, #11	#10, #11, #12	1¼″, 1½″

For special centers or SIZES not shown, write for quotation, giving necessary information.

TO ORDER AN ADJUSTABLE CENTER Specify taper size required. An Order Form is included in this catalog for your convenience.

HOW IT WORKS:

Sleeve and arbor are equally eccentric ground. Assembled, they complement each other at "0" and produce lateral movement of the tip in increments of .0005″ or .001″ on diameter, when rotated each side of "0."

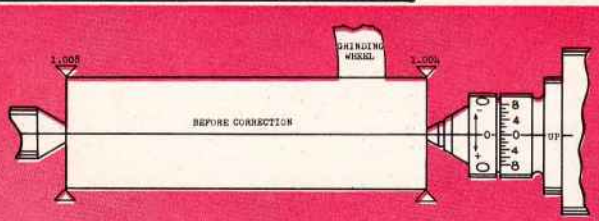


Fig. 1 shows arbor and sleeve zeroed with each other and a .004″ taper on the diameter workpiece or .002″ center misalignment.

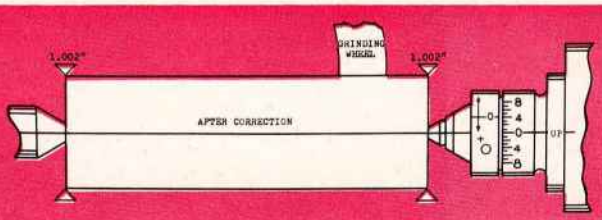
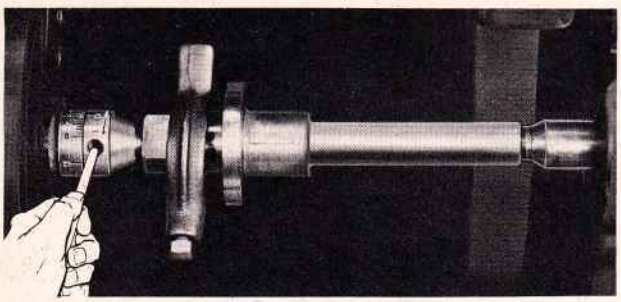
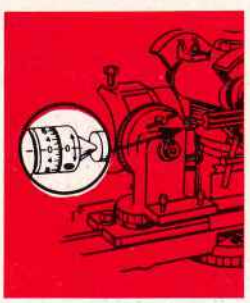
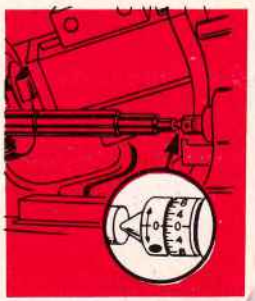


Fig. 2 shows correction made by turning "0" on the arbor to 4 on the **minus** side (or away from operator) which has moved the tip **toward** the operator .002″ and centered the workpiece.



ADJUSTABLE CENTER IN HEADSTOCK OF DEAD SPINDLE GRINDER with half center in tailstock for small work requiring wheel clearance. The zero of the Adjustable Center is in a vertical position to provide **lateral** movement of the tip and the workpiece. This lateral movement permits the operator to quickly correct a taper (within tenths) if the shaft is to be ground straight or tapered.





ADDITIONAL APPLICATIONS

Helical milling cutters may be precisely re-ground parallel by using Adjustable Center mounted in the headstock.

Taper reamers can be re-ground using the Micro-Set Adjustable Center. Since the tip movement is calibrated in .0005″, movement between graduations allows operator to work to .0001″ or .0002″.

Adjustable Center used in tailstock of gear shaving machine. Pinion length with respect to distance between centers gives additional numerical calibrations.

T-SLOT TURRET TOOL POST SELECTION CHART BASED ON LATHE CENTER HEIGHT AND MAXIMUM TOOL HEIGHT

Lathe Center Height is the distance from top of compound to center line of spindle.

In selecting your turret it is best to choose one which will mount the largest tool you will use in your lathe since you can use smaller tools merely by shimming them up. You then have a turret that can be used for any work within the capacity of your machine. When ordering, please furnish the dimensions shown in Chart being sure to specify the maximum tool height, H.S.S. or Carbide toolholder used.

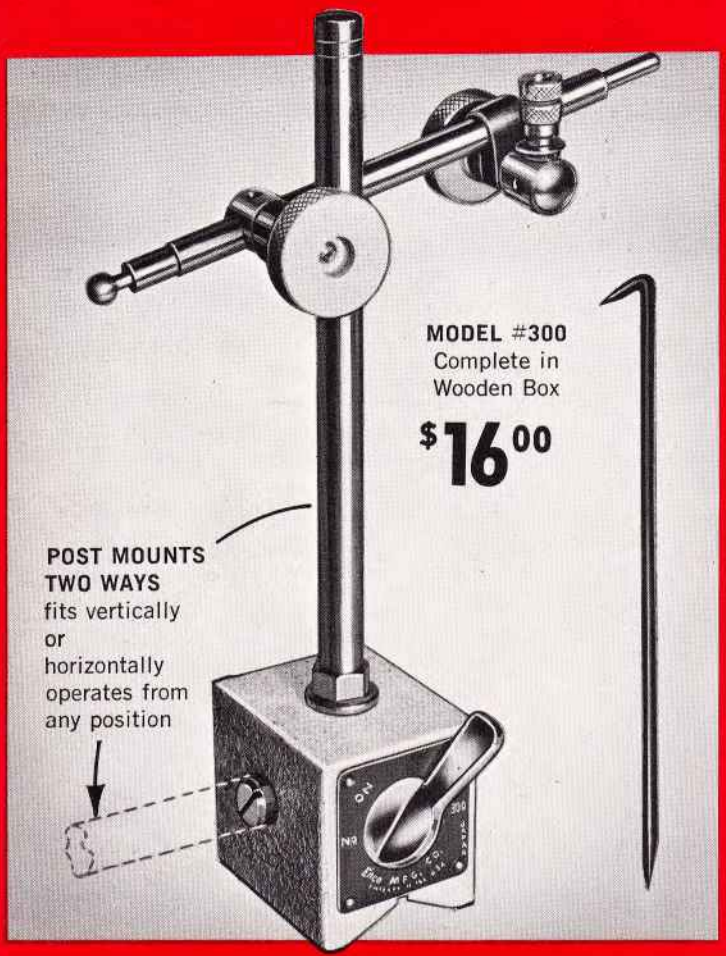
Center Height	2½-S	3½-C & 3½-S	3½-R	4½-C & 4½-S	4½-R	6-S	HD-1	HD-2	HD-3	HD-4
3/4"	1/4"									
13/16"	5/16"									
7/8"	3/8"									
15/16"	3/8"	3/8"								
1"	3/8"	7/16"								
1 1/16"	3/8"	1/2"								
1 1/8"	3/8"	1/2"								
1 3/16"	3/8"	1/2"								
1 1/4"	3/8"	1/2"	5/8"							
1 5/16"	3/8"	1/2"	11/16"	5/8"						
1 3/8"		1/2"	3/4"	11/16"	3/4"					
1 7/16"		1/2"	13/16"	3/4"	3/4"					
1 1/2"		1/2"	7/8"	3/4"	3/4"					
1 9/16"		1/2"	7/8"	3/4"	13/16"					
1 5/8"		1/2"	7/8"	3/4"	7/8"		3/4"			
1 11/16"		1/2"	7/8"	3/4"	15/16"	7/8"	13/16"			
1 3/4"		1/2"	7/8"	3/4"	1"	15/16"	7/8"			
1 13/16"		1/2"	7/8"	3/4"	1"	1"	15/16"			
1 7/8"			7/8"	3/4"	1"	1 1/16"	1"			
1 15/16"			7/8"	3/4"	1"	1 1/8"	1"			
2"			7/8"	3/4"	1"	1 3/16"	1"	1"		
2 1/16"			7/8"	3/4"	1"	1 1/4"	1"	1 1/16"		
2 1/8"			7/8"	3/4"	1"	1 1/4"	1"	1 1/8"		
2 3/16"				3/4"	1"	1 1/4"	1"	1 3/16"		
2 1/4"					1"	1 1/4"	1"	1 1/4"		
2 5/16"					1"	1 1/4"	1"	1 5/16"		
2 3/8"					1"	1 1/4"	1"	1 3/8"	1 1/4"	
2 7/16"						1 1/4"	1"	1 7/16"	1 5/16"	
2 1/2"						1 1/4"	1"	1 1/2"	1 3/8"	
2 9/16"						1 1/4"		1 1/2"	1 7/16"	
2 5/8"						1 1/4"		1 1/2"	1 1/2"	
2 11/16"						1 1/4"		1 1/2"	1 9/16"	
2 3/4"						1 1/4"		1 1/2"	1 5/8"	
2 13/16"								1 1/2"	1 11/16"	
2 7/8"								1 1/2"	1 3/4"	1 1/2"
2 15/16"								1 1/2"	1 3/4"	1 9/16"
3"								1 1/2"	1 3/4"	1 5/8"
3 1/16"								1 1/2"	1 3/4"	1 11/16"
3 1/8"								1 1/2"	1 3/4"	1 3/4"
3 1/4"									1 3/4"	1 7/8"
3 3/8"									1 3/4"	2"
3 1/2"									1 3/4"	2"
3 5/8"									1 3/4"	2"
3 3/4"									1 3/4"	2"
3 7/8"										2"

Should your application require a larger tool height than shown above, we call your attention to our Compound Replacement models shown on page 6.

These turrets give you more rigidity, since they eliminate the compound, and give you a one piece tool support from the cross-slide up.

Small angular turning and chamfering can be done with the face or side of the tools because of the 12 position indexing which is standard on all Enco Turret Tool Posts.

NEW! Enco® "ON-OFF" Magnetic Base Indicator Holder Fits All Popular Indicators



EXCLUSIVE! 3 diameter universal rod has 7/32" and 5/16" ends . . . swivel adaptor for lug back, 1/4", and 5/32" indicators. Length 7". No time wasted changing rods.

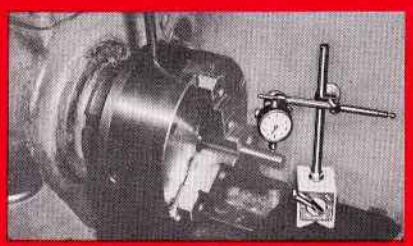
EXCLUSIVE! Centered "V" magnet puts strongest possible grip on round surfaces.

Two magnetic mounting surfaces—on bottom and back.

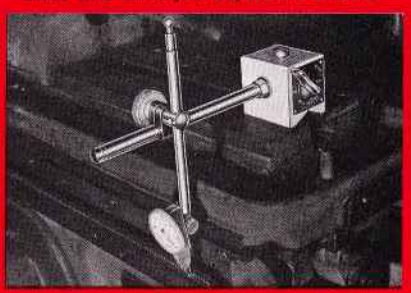
"ON-OFF" lever control for easy one-hand mounting and dismounting. Won't mar polished surfaces.

STRONGER! 100 lb. magnetic pull insures vibration-proof mounting. Powerful enough for large lug back indicators.

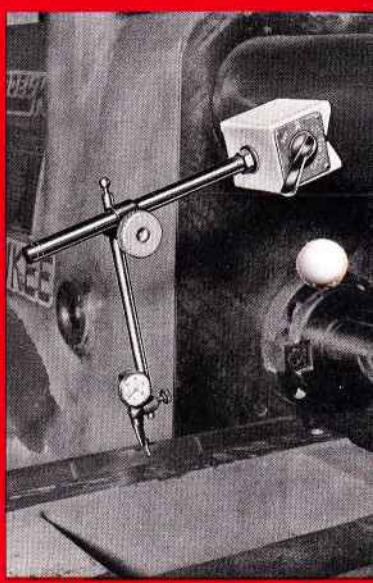
Magnet Dimensions: 1⅞"x2⅜"2⅛" High.
Height from base to top of stem: 10¼".



Model #300 with lug back indicator zeros in a three-jaw adjustable chuck.



With mounting post in horizontal position, indicator helps set a required taper on grinder.



Model #300 mounts securely on round surfaces. Here it checks work piece on milling machine.

Enco® ONE YEAR GUARANTEE

Enco products are guaranteed to be free from defects in materials and workmanship for one year from date of purchase. We will replace any part or parts found to be defective after receipt of the product in our plant. It is the intent of Enco Manufacturing Company that every purchaser of any Enco product be completely satisfied with his purchase.

IN ADDITION TO THE GENERAL GUARANTEE, we make the following specific guarantees about these products:

TURRET TOOL POST: Re-indexing accuracy to .0005"

TAILSTOCK TURRETS: Shank to hole alignment ± .001"

SELF-INDEXING HEXTURRETS:
Re-indexing accuracy ± .0005"

MICRO-SET ADJUSTABLE CENTERS:
Accurate within .006" range to ± .0002"

TINY-TITAN MAGNETIC BASE TOOLS:
Magnetic pull—Single, 65 lbs.; Duplex, 125 lbs.
Intermediate, 80 lbs.; ON-OFF, 100 lbs.

NOTE: A Guarantee Certificate is enclosed with each Enco Product